

09/504022

Cofc

Patent 6,993,156

PATENT

**IN UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicant: Richard S. Szeliski et al.

Examiner: Edwards, Patrick L

Patent No.: 6,993,156

Group Art Unit: 2621

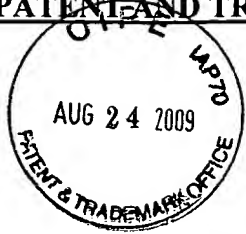
Issue Date: Jan. 31, 2006

Confirmation No.: 9342

Customer No.: 22971

Docket No: 141373.01

Title: SYSTEM AND METHOD FOR STATISTICALLY COMPARING AND MATCHING  
PLURAL SETS OF DIGITAL DATA



**REQUEST FOR CERTIFICATION OF CORRECTION**

Attn: Certificate of Correction Branch  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

It is requested that a Certificate of Correction be issued correcting printing errors appearing in the above-identified United States patent. Two copies of the text of the Certificate in the suggested form are enclosed.

Pursuant to 1.20(a), the examiner is authorized to charge the Certificate of Correction fee of \$100.00 to the Deposit Account No. **50-0463**.

Issuance of the Certificate of Correction would neither expand nor contract the scope of the claims as properly allowed, and re-examination is not required.

The Examiner is authorized to charge any additional fees or credit overpayment to Deposit Account No. **50-0463**.

**Certificate**

**AUG 26 2009**

**of Correction**

08/24/2009 EEKUBAY1 00000019 500463 6993156

01 FC:1811 100.00 DA

Respectfully submitted,

**Customer Number: 22971**

Date: June 23, 2009

By: /Sung T. Kim/

Attorney Name: Sung T. Kim

Reg. No.: 45,398

CERTIFICATE UNDER 37 CFR § 1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: Attn: Certificate of Correction Branch, Commissioner for Patents, P.O. Box 1450 Alexandria, VA 22313-1450, on this 20<sup>th</sup> day of August 2009.

Christine Hartness  
Christine Hartness

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.  
(Also Form PTO-1050)

## UNITED STATES PATENT AND TRADEMARK OFFICE CERTIFICATE OF CORRECTION

PATENT NO : 6,993,156  
DATED : Jan. 31, 2006  
INVENTOR(S) : Richard S. Szeliski et al.

It is certified that errors appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

On the face page, in field (56), under "Other Publications", in column 2, line 7, delete "p." and insert -- pp. --, therefor.

On the face page, in field (56), under "Other Publications", in column 2, line 13, delete "9ICCV'98)," and insert -- 9ICCV'98, --, therefor.

On the face page, in field (56), under "Other Publications", in column 2, line 17, after "parametrics" delete "," and insert -- . --, therefor.

In column 2, line(s), 47-55, delete "Alternatively, an RGB or RGBA image can represent a three or four dimensional vector field defined over a subset of the plane. Consequently, highly parallelized calculations can be performed on entire functions or vector fields directly within the graphics hardware of a conventional computer graphics card or the like. Such uses of conventional graphics hardware for performing these types of computations have been well known to those skilled in the art for a number of years." and insert -- Alternatively, an RGB or RGBA image can represent a three or four dimensional vector field defined over a subset of the plane. Consequently, highly parallelized calculations can be performed on entire functions or vector fields directly within the graphics hardware of a conventional computer graphics card or the like. Such uses of conventional graphics hardware for performing these types of computations have been well known to those skilled in the art for a number of years. --, therefor, on line 48 as a new paragraph.

In column 5, line 54, after "data" delete "is".

In column 8, line 17, after "408." delete "The" and insert -- In one embodiment, the --, therefor.

In column 8, line 18, delete "can store" and insert -- then stores --, therefor.

MAILING ADDRESS OF SENDER:

CPA Global  
P.O. Box 52050  
Minneapolis, MN 55402

PATENT NO. 6,993,156

No. of additional copies

➡ Page 5 of 7

Atty Docket No: 141373.01

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.  
(Also Form PTO-1050)

## UNITED STATES PATENT AND TRADEMARK OFFICE CERTIFICATE OF CORRECTION

PATENT NO : 6,993,156  
DATED : Jan. 31, 2006  
INVENTOR(S) : Richard S. Szeliski et al.

It is certified that errors appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

In column 8, line 19, delete "can be" and insert - - is - -, therefor.

In column 8, line 26, delete "can be" and insert - - is - -, therefor.

In column 8, line 26, after "accomplished" insert - - using a statistics/comparison device 418 in combination - -.

In column 8, line 27, delete "which will be" and insert - - as - -, therefor.

In column 8, line 37, after "v<sub>2</sub>" delete " , ".

In column 8, line 38, after "sy" delete " , ".

In column 8, line 44, after "in" insert - - the - -.

In column 8, line 61, after "412" delete " , ".

In column 9, line 16, delete "These" and insert - - The - -, therefor.

In column 9, line(s) 51-59, delete "
$$\frac{\text{covariance}(I, T)}{\sigma_I \sigma_T} = \frac{\sum_x \sum_y (T(x, y) - \mu_T)(I(x - u, y - v) - \mu_I)}{\sqrt{\sum_x \sum_y (I(x - u, y - v) - \mu_I)^2 \sum_x \sum_y (T(x, y) - \mu_T)^2}}$$
" and  
insert - - 
$$\frac{\text{covariance}(I, T)}{\sigma_I \sigma_T} = \frac{\sum_x \sum_y (T(x, y) - \mu_T)(I(x - u, y - v) - \mu_I)}{\sqrt{\sum_x \sum_y (I(x - u, y - v) - \mu_I)^2 \sum_x \sum_y (T(x, y) - \mu_T)^2}}$$
 - -, therefor.

In column 11, line 12, after "α" delete " , ".

MAILING ADDRESS OF SENDER:

CPA Global  
P.O. Box 52050  
Minneapolis, MN 55402

PATENT NO. 6,993,156

No. of additional copies

➡ Page 6 of 7

Atty Docket No: 141373.01

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.  
(Also Form PTO-1050)

## UNITED STATES PATENT AND TRADEMARK OFFICE CERTIFICATE OF CORRECTION

PATENT NO : 6,993,156  
DATED : Jan. 31, 2006  
INVENTOR(S) : Richard S. Szeliski et al.

It is certified that errors appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

In column 12, line(s) 19-32, delete "In one specific embodiment of the example of FIG. 5, the template is treated as a texture and the frame buffer an image and the display primitive for rendering purposes is a triangular polygon. In addition, instead of rasterizing the texture into the frame buffer, certain statistics are recorded for normalized correlation or other statistics can be recorded for various embodiments. In one example, if the texture is considered a template and the frame buffer an image, the graphics processor 513 is used to resample the template using a perspective transformation. Also, the statistics/comparison device 518 of the modified graphics processor 513 is used to record statistics ( $\sum T$ ,  $\sum I$ ,  $\sum IT$ ,  $\sum T^2$ ,  $\sum I^2$  for normalized correlation, or other statistics for a variation) for later forwarding to the host processor." and insert - - In one specific embodiment of the example of FIG. 5, the template is treated as a texture and the frame buffer an image and the display primitive for rendering purposes is a triangular polygon. In addition, instead of rasterizing the texture into the frame buffer, certain statistics are recorded for normalized correlation or other statistics can be recorded for various embodiments. In one example, if the texture is considered a template and the frame buffer an image, the graphics processor 513 is used to resample the template using a perspective transformation. Also, the statistics/comparison device 518 of the modified graphics processor 513 is used to record statistics ( $\sum T$ ,  $\sum I$ ,  $\sum IT$ ,  $\sum T^2$ ,  $\sum I^2$  for normalized correlation, or other statistics for a variation) for later forwarding to the host processor. - -, therefor, on line 20 as a new paragraph.

MAILING ADDRESS OF SENDER:

CPA Global  
P.O. Box 52050  
Minneapolis, MN 55402

PATENT NO. 6,993,156

No. of additional copies

 Page 7 of 7

Atty Docket No: 141373.01